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Arterial stiffness in chronic renal failure and after renal transplantation.

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Source

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Abstract

Arterial stiffness is an independent cardiovascular risk factor, along with aging, hypertension, and cardiovascular disease. The augmentation index (AIx) and pulse wave velocity (PWV) are early markers of atherosclerotic vascular changes. Arteriography was used to determine systolic and diastolic blood pressure, pulse pressure (PP), AIx, and PWV in 82 male and 64 female renal transplant recipients (mean [SD] age, 45.3 [11.2] years). Cardiovascular risk was assessed using echocardiography and ultrasonography of the carotid arteries. The left ventricular wall thickness, ejection fraction, and stenosis of the carotid arteries were also measured. Fasting serum creatinine, cystatin C, homocysteine, C-reactive protein, immunoreactive parathyroid hormone, lipid, and calcium-phosphorus concentrations were determined. The serum cystatin concentration was 2.1 (0.2) mg/L, and the homocysteine concentration, 15.2 (2.6) micromol/L. After transplantation, body mass index, fat mass, and visceral fat area increased significantly ($P < .01$). The AIx was increased (AIx > or =10%) in 20% of men and 37% of women, PWV was increased (>10 m/s) in 43% of men and 34% of women, and PP was pathologically high (>12 m/s) in 10% of men and 12% of women. The PWV was significantly related to age ($r = 0.52$) and ventricular wall thickness ($r = 0.46$). Pulse pressure, BMI, and systolic and diastolic blood pressure correlated positively but modestly with PWV. There was a significant relationship between AIx80 and systolic ($r = 0.42$) and diastolic ($r = 0.39$) blood

pressure and PP (r = 0.33). The ejection fraction correlated negatively with PWV and AIx. There was a strong association between carotid artery stenosis, PWV, and AIx80. All patients with PWV greater than 10 m/s demonstrated carotid artery stenosis. In conclusion, arteriography is an objective, noninvasive, and convenient method for early diagnosis and follow-up of atherosclerosis.